Statement of Basis

Permit to Construct No. P-2009.0071
Project ID 62220

Knife River Corporation – Mountain West - 00386
Portable, Idaho

Facility ID 777-00386

Final

June 14, 2019
Dan Pitman, PE
Permit Writer

The purpose of this Statement of Basis is to satisfy the requirements of IDAPA 58.01.01.et seq, Rules for the Control of Air Pollution in Idaho, for issuing air permits.

ACRONYMS, UNITS, AND CHEMICAL NOMENCLATURE

acfm	actual cubic feet per minute
Btu	British thermal units
CBP	concrete batch plant
cfm	cubic feet per minute
CFR	Code of Federal Regulations
CO	carbon monoxide
CO_2	carbon dioxide
DEQ	Department of Environmental Quality
dscf	dry standard cubic feet
EL	screening emission levels
EPA	U.S. Environmental Protection Agency
gr	grains (1 lb = 7,000 grains)
HAP	hazardous air pollutants
IDAPA	a numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
km	kilometers
lb/hr	pounds per hour
lb/yr	pound per any consecutive 12-month period
m	meters
MMBtu	million British thermal units
MMscf	million standard cubic feet
NAAQS	National Ambient Air Quality Standard
NO_2	nitrogen dioxide
NO_X	nitrogen oxides
NSPS	New Source Performance Standards
PAH	polyaromatic hydrocarbons
PC	permit condition
PERF	Portable Equipment Relocation Form
PM	particulate matter
$PM_{2.5}$	particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers
PM_{10}	particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
POM	polycyclic organic matter
PSD	Prevention of Significant Deterioration
PTC	permit to construct
PTE	potential to emit
Rules	*Rules for the Control of Air Pollution in Idaho*
scf	standard cubic feet
SCL	significant contribution limits
SIP	State Implementation Plan
SO_2	sulfur dioxide
SO_x	sulfur oxides
T/day	tons per calendar day
T/hr	tons per hour
T/yr	tons per consecutive 12 calendar month period
TAP	toxic air pollutants
VOC	volatile organic compounds
yd^3	cubic yards
$\mu g/m^3$	micrograms per cubic meter

FACILITY INFORMATION

Description

Knife River Corporation – Mountain West - 00386 is a portable truck ready mix concrete batch plant. The ready mix concrete batch plant consists of four-compartment aggregate storage bin with an integral batcher, two storage silos, four baghouses, conveyors, PIG portable horizontal cement storage silo, and 2.8 MMBtu/hr natural gas hot water heater. The maximum production rate is 300 cubic yards (cy) of concrete per hour. The plant combines sand, gravel, cement, fly ash or cement supplement, and water to produce concrete. Electrical power will be supplied to the ready mix plant from the local power grid.

The sources of emissions at the facility include: five baghouses that pick up dust from cement storage silos, fly ash silo, cement batcher, truck mix loading; and the hot water heater.

Permitting History

The following information was derived from a review of the permit files available to DEQ. Permit status is noted as active and in effect (A) or superseded (S).

October 13, 2006	PTC No. P-060021, initial PTC for a portable concrete batch plant issued to Masco, Inc. located in Boise, (S)
August 14, 2009	PTC No. P-2009.0071, PTC modification to add 2.8MMBtu diesel fired hot water heater and a portable horizontal cement storage silo, (S)
April 2, 2018	PTC No P-2009.0071, Revised PTC to change the facility name from Masco dba Knife River 777-00386 to Knife River Corporation – Mountain West – 00386 (S)
November 21, 2018	PTC No P-2009.0071, Modified PTC change the permitted fuel for the 2.8 MMBtu/hr hot water heater (A, but will become S upon issuance of this permit)

Application Scope

This PTC is for a modification at an existing minor facility. The applicant has proposed to add a fly ash silo and reduce annual production to from 2,628,000 cubic yards per any consecutive 12-calendar month period to 360,000 cubic yards.

Application Chronology

April 17, 2019	DEQ received an application.
April 18, 2019	DEQ received an application fee and processing fee.
April 19 – May 8, 2019	DEQ provided an opportunity to request a public comment period on the application and proposed permitting action.
April 26, 2019	DEQ determined that the application was complete.
May 21, 2019	DEQ made available the draft permit and statement of basis for peer and regional office review.
June 6, 2019	DEQ made available the draft permit and statement of basis for applicant review.

TECHNICAL ANALYSIS

Emissions Units and Control Equipment

Table 1 EMISSIONS UNIT AND CONTROL EQUIPMENT INFORMATION

Sources	Control Equipment	Emission Point ID No.
Cement I storage bin (PIG) Horizontal cement silo	PJC-300S silo dust control system/baghouse Control efficiency (PM and PM_{10}): 99.9%	Stack height: 45 ft Equivalent stack diameter: 0.9 ft. Exit air flow rate: 1,500 cfm for cement, or 1,000 cfm for fly ash
Cement II Mobile storage silo	PJC-300S silo dust control system/baghouse Control efficiency (PM and PM_{10}): 99.9%	Stack height: 56 ft Equivalent stack diameter: 0.9 ft. Exit air flow rate: 1,500 cfm for cement, or 1,000 cfm for fly ash
Fly Ash Silo	Belle 330 Pulse Jet Baghouse Control efficiency (PM and PM_{10}): 99.9%	No information other than exit air flowrate up to 1,600 acfm.
Cement batcher	BV-14 batcher dust control system/baghouse Control efficiency (PM and PM_{10}): 99.9%	Stack height: 16 ft Equivalent stack diameter: 0.65 ft Exit air flow rate: 180 cfm
Truck mix loading	PJ-980 dust control system/baghouse Control efficiency (PM and PM_{10}): 99.9%	Stack height: 38 ft Equivalent stack diameter: 1.7 ft. Exit air flow rate: 5,880 cfm
2.8 MMBtu/hr natural gas hot water heater	None	Stack height: 10 ft Stack diameter: 10 inches Stack temperature: 761 degrees F Exit flow: 885 acfm

Emissions Inventories

Potential to Emit

IDAPA 58.01.01 defines Potential to Emit as the maximum capacity of a facility or stationary source to emit an air pollutant under its physical and operational design. Any physical or operational limitation on the capacity of the facility or source to emit an air pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored or processed, shall be treated as part of its design if the limitation or the effect it would have on emissions is state or federally enforceable. Secondary emissions do not count in determining the potential to emit of a facility or stationary source.

Pre-Project Potential to Emit

Pre-project Potential to Emit is used to establish the change in emissions at a facility as a result of this project.

The following table presents the pre-project potential to emit for all criteria pollutants from all emissions units at the facility verified by DEQ staff. See Appendix A for a detailed presentation of the calculations of these emissions for each emissions unit.

Table 2 PRE- PROJECT POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Source	PM_{10}		SO_2		NO_X		CO		VOC	
	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]
Cement I or Cement II storage bin dust control system/baghouse	0.025	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cement batcher dust control system/baghouse	0.0119	0.052	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Truck mix loading dust control system/baghouse	0..24	1.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
water heater	0.021	0.091	0.0017	0.0072	0.0275	1.20	0.0231	1.01	0.0151	0.066
Pre-Project Totals	**0.30**	**1.28**	**0.00**	**0.01**	**0.03**	**1.20**	**0.02**	**1.01**	**0.02**	**0.07**

a) Controlled average emission rate in pounds per hour is a daily average, based on the proposed daily operating schedule and daily limits.
b) Controlled average emission rate in tons per year is an annual average, based on the proposed annual operating schedule and annual limits.

Post Project Potential to Emit

Post project Potential to Emit is used to establish the change in emissions at a facility and to determine the facility's classification as a result of this project. Post project Potential to Emit includes all permit limits resulting from this project.

The following table presents the post project Potential to Emit for criteria pollutants from all emissions units at the facility as determined by DEQ staff. See Appendix A for a detailed presentation of the calculations of these emissions for each emissions unit.

Table 2 POST PROJECT POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Source	PM_{10}		SO_2		NO_X		CO		VOC	
	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]
Cement I or Cement II storage bin dust control system/baghouse	0.025	0.015	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fly Ash Silo	0.0536	0.0322	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cement batcher dust control system/baghouse	0.0119	0.0071	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Truck mix loading dust control system/baghouse	0..24	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
water heater	0.021	0.091	0.0017	0.0072	0.0275	1.20	0.0231	1.01	0.0151	0.066
Pre-Project Totals	**0.35**	**0.29**	**0.00**	**0.01**	**0.03**	**1.20**	**0.02**	**1.01**	**0.02**	**0.07**

c) Controlled average emission rate in pounds per hour is a daily average, based on the proposed daily operating schedule and daily limits.
d) Controlled average emission rate in tons per year is an annual average, based on the proposed annual operating schedule and annual limits.

Change in Potential to Emit

The change in facility-wide potential to emit is used to determine if a public comment period may be required and to determine the processing fee per IDAPA 58.01.01.225. The following table presents the facility-wide change in the potential to emit for criteria pollutants.

Table 2 CHANGES IN POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Source	$PM_{10}/PM_{2.5}$		SO_2		NO_X		CO		VOC	
	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr
Pre-Project Potential to Emit	**0.30**	**1.28**	**0.00**	**0.01**	**0.03**	**1.20**	**0.02**	**1.01**	**0.02**	**0.07**
Post Project Potential to Emit	**0.35**	**0.29**	**0.00**	**0.01**	**0.03**	**1.20**	**0.02**	**1.01**	**0.02**	**0.07**
Changes in Potential to Emit	**0.05**	**-0.99**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

TAP Emissions

A summary of the estimated emissions increase of toxic air pollutants (TAP) from the addition of the fly ash silo is provided in the following table. Since this is a new emission unit pre-project emissions are zero.

Table 3 PRE- AND POST PROJECT POTENTIAL TO EMIT FOR TOXIC AIR POLLUTANTS

Toxic Air Pollutants	Pre-Project 24-hour Average Emissions Rates for Units at the Facility (lb/hr)	Post Project 24-hour Average for Non-carcinogens and Annual Average for Carcinogens Emissions Rates (lb/hr)	Screening Emission Level (lb/hr)	Exceeds Screening Level? (Y/N)
Arsenic[1]	0	1.50E-06	1.50E-06	No
Beryllium[1]	0	1.36E-07	2.80E-05	No
Cadmium[1]	0	2.97E-10	3.70E-06	No
Chromium[2]	0	8.99E-05	3.30E-02	No
Manganese[2]	0	1.89E-05	3.33E-01	No
Nickel[1]	0	3.42E-06	2.70E-05	No
Phosphorus[2]	0	2.61E-04	7.00E-03	No
Selenium[2]	0	7.93E-07	1.30E-02	No
Chromium VI[1]	0	5.49E-07	5.60E-07	No

1) Carcinogen
2) Non-carcinogen

All changes in emissions rates for TAP do not exceed the EL (screening emissions level) as a result of this project. Therefore, modeling is not required for any TAP because none of the screening ELs identified in IDAPA 58.01.01.585 & 586 were exceeded.

Post Project HAP Emissions

The facilities potential to emit HAP does not change as a result of the addition of the fly ash silo as determined by DEQ's general permit spreadsheet for calculating emissions from concrete batch plants. This is because facility was previously permitted to use fly ash. The total facility-wide potential HAP emissions does not exceed 0.025 tons per year, therefore the source is not a HAP major source because neither the maximum individual HAP or aggregate HAPs exceeds the major facility thresholds of 10 tons per year for an individual HAP and 25 tons per year in aggregated HAPs.

Ambient Air Quality Impact Analyses

As presented in the Modeling Memo in Appendix B, the estimated emission rates of PM_{10}, $PM_{2.5}$, and TAP from this project were below applicable screening emission levels (EL) and published DEQ modeling thresholds established in IDAPA 58.01.01.585-586 and in the State of Idaho Air Quality Modeling Guideline[1]. Refer to the Emissions Inventories section for additional information concerning the emission inventories.

REGULATORY ANALYSIS

The only change to the facility is to add a fly ash silo and the regulatory analysis that must be conducted is demonstration of preconstruction compliance with toxic standards from that source. As demonstrated previously in the emission inventory section of this statement of basis none of the toxic air pollutant emissions increases exceed a toxic air pollutant screening emission levels and preconstruction compliance is demonstrated.

[1] Criteria pollutant thresholds in Table 2, State of Idaho Guideline for Performing Air Quality Impact Analyses, Doc ID AQ-011, September 2013.

The addition of the flay ash silo does not affect:

- NSPS/NESHAP applicability because the fly ash silo is not an affected facility.
- Facility classification because the permitted potential to emit does not change enough to affect facility classification.
- Areas which the source is allowed to operate does not change.

Permit Conditions Review

This section describes only those permit conditions that have been added, revised, modified or deleted as a result of this permitting action.

Permit Conditions 1.1 and 1.2

This section is the "Purpose" of the permit action which is to add a fly ash silo to the facility and replace the existing permit.

Tables 1.1 and 2.1

These tables were updated to list the new fly ash storage silo. An equivalent silo may be used. Equivalent is defined in the permit as any silo with less than or equal to 110 cubic yard capacity and rated flow less than or equal to 1,600 acfm.

Permit Condition 2.3/Table 2.2

Table 2.2 was updated to limit emissions of PM_{10}, arsenic and nickel from the new fly ash silo consistent with the other sources listed in Table 2.2.

Permit Condition 2.6

The annual production was lowered from 2,628,000 cubic yards per any consecutive 12-calendar month period to 360,000 cubic yards. Lowering the throughput to this amount results in the emission increase from the new fly ash silo so that toxic air pollutants from that source do not exceed the screening emissions level.

PUBLIC REVIEW

Public Comment Opportunity

An opportunity for public comment period on the application was provided in accordance with IDAPA 58.01.01.209.01.c or IDAPA 58.01.01.404.01.c. During this time, there was not a request for a public comment period on DEQ's proposed action. Refer to the chronology for public comment opportunity dates.

APPENDIX A – EMISSIONS INVENTORIES

Post Project Data Input

1. Facility Information

Facility Name:	**Knife River Corporation Mountain West - Boise**
Facility ID:	**777-00386**
Permit and Project No.:	**P-2009.0071**
Source Type:	**Portable**
Manufacturer/Model:	**CON-E-CO/LO-PRO-12 or equivalent**

2. Concrete Production Rates

Maximum Hourly Concrete Production Rate:	300		
Proposed Daily Concrete Production Rate:	7,200	cy/day	24.00
Proposed Maximum Annual Concrete Production Rate:	360,000	cy/year	hr/day

3. Daily Operating Hours

Maximum daily hours of operation for facility?	24

4. Concrete Batch Plant Specifications

Is the facility type a truck mix (T) or central mix (C)?	T
What level of PM control is used for loadout, either Truck or Central?	99%
What level of PM control is used for fugitive emissions?	75%

5. Water Heater Usage

		Heat Input Rating	
Does this facility use a water heater?	Yes		
How many units?	1		
What type of fuel, Diesel, Natural Gas or Propane for unit 1?	Natural Gas	2.8	MMBtu/hr
If multiple units, what type of fuel, Diesel, Natural Gas or Propane for unit 2?	N/A	0	MMBtu/hr
Are you assuming continual operations throughout the year?	No		
Maximum annual hours of water heater operation? (If assuming continual operation, enter 8,760)	8,760		

6. Internal Combustion Engine(s)

Are internal combustion engines used to provide electrical power at the facility?	No
How many small engines (less than or equal to 600 bhp) are being used at the facility?	0
Horsepower rating of small engine #1 (<=600 bhp)? (If non road or no engine enter 0)	0
Horsepower rating of small engine #2 (<=600 bhp)? (If non-road or no engine enter 0)	0
Horsepower rating of large engine (greater than 600 bhp)? (If non-road or no engine enter 0)	0

Please enter 0 for all units.

Note: If there is no small or large engine enter -1 for the certification	Small IC Engine #1	Small IC Engine #2	Large IC Engine
Select the EPA Certification:	-1	-1	-1
Not an EPA-certified IC engine: Enter "0" (zero)			
Certified Tier I, Tier 2, Tier 3, or Tier 4 IC engine: Enter 1, 2, 3, or 4			
Certified "BLUE SKY" IC engine: Enter 5			

Enter the annual operating hours for the small IC engine(s)	0
Enter the annual operating hours for the large IC engine	0

7. Transfer Points

Enter the total number of transfer points in the facility? (2 is the default)	2

CRITERIA POLLUTANT EMISSION INVENTORY for Portable Concrete Batch Plant

Facility Information 4/26/19 11:47

Company/ Facility ID	Knife River Corporation Mountain West - Boise 777-00388
Permit and Project No.	P-2009.0071
Source Type	Portable
Manufacturer/Model	CON-E-CO LO PRO-12 or equivalent

Assumptions Implied or Stated in Application:

See control assumptions

Truck Mix (T) or Central Mix (C) T

Production Rates[1]

Maximum Hourly Production Rate	300	cy/hr		Per manufacturer
Proposed Daily Production Rate	7,200	cy/day	24.00	Hours of operation per day at max capacity
Proposed Maximum Annual Production Rate	360,000	cy/year		
Cement Storage Silo Capacity	450	ft³ of sampled cement		
Cement Storage Silo Large Compartment Capacity for cement only	60%	of the silo capacity		
Cement Storage Silo small Compartment Capacity for cement or ash	35%	of the silo capacity		

PM_{10} Emissions due to this PTC

Emissions Point	PM_{10} Emission Factor[1] (lb/cy)		PM_{10} Emission Factor[2] (lb/cy)		Controlled Emission Rate PM_{10}, Max	Controlled Emission Rate PM_{10}, Max	Controlled Emission Rate PM_{10}, 24-hour average		Controlled Emission Rate PM_{10}, 24-hour average		Controlled Emission Rate PM_{10}, annual average		Controlled Emission Rate PM_{10}, annual average		Control Assumptions:	
	Controlled	Uncontrolled	Controlled	Uncontrolled	lb/hr[3]	lb/hr[3]	lb/hr[4]	lb/day[4]	lb/hr[4]	lb/day[4]	lb/hr[4]	T/yr[5]	lb/hr[4]	T/yr[5]		
Aggregate delivery to ground storage		0.00098		0.0031	0.07	0.23	0.07	1.73	0.233	5.58	9.88E-03	4.32E-02	0.032	0.140	75%	Water Sprays at Operator's Discretion
Sand delivery to ground storage		0.000225		0.0007	0.02	0.05	1.69E-02	0.41	0.053	1.27	2.31E-03	1.01E-02	0.007	0.032	75%	Water Sprays at Operator's Discretion
Aggregate transfer to conveyor		0.00098		0.0031	0.07	0.23	0.07	1.73	0.233	5.58	9.88E-03	4.32E-02	0.032	0.140	75%	Water Sprays at Operator's Discretion
Sand transfer to conveyor		0.000225		0.0007	0.02	0.05	1.69E-02	0.41	0.053	1.27	2.31E-03	1.01E-02	0.007	0.032	75%	Water Sprays at Operator's Discretion
Aggregate transfer to elevated storage		0.00098		0.0031	0.07	0.23	0.07	1.73	0.233	5.58	9.88E-03	4.32E-02	0.032	0.140	75%	Water Sprays at Operator's Discretion
Sand transfer to elevated storage		0.000225		0.0007	0.02	0.05	1.69E-02	0.41	0.053	1.27	2.31E-03	1.01E-02	0.007	0.032	75%	Water Sprays at Operator's Discretion
Cement delivery to Silo (controlled EF)	0.00003		0.0001		9.00E-03	2.50E-02	9.00E-03	2.16E-01	2.50E-02	6.01E-01	1.23E-03	5.49E-03	3.43E-03	1.50E-02	0.00%	Baghouse is process equipment, use controlled EF
Cement supplement delivery to Silo (controlled EF)	0.000045		0.0002		1.35E-02	3.75E-02	1.35E-02	3.24E-01	3.75E-02	1.20E+00	1.85E-03	8.10E-03	7.35E-03	3.22E-02	0.00%	Baghouse is process equipment, use controlled EF
Weigh hopper loading (sand & aggregate batcher section)		0.001185		0.00385	3.56E-03	1.19E-02	3.56E-03	8.53E-02	1.19E-02	2.85E-01	4.87E-04	2.13E-03	1.82E-03	7.11E-03	99.0%	Sealed belt (varies per x to silo) or baghouse
Truck mix loading, Table 11.12-2, "0.156 lb/ton of cement/flyash" x ((491 lb cement + 73 lb flyash)/cy concrete)/ 2000 lb = 0.0874 lb/cy. PM2.5 was calculated as 15% of PM: "0.110 lb/ton of cement/flyash" x ((491 lb cement + 73 lb flyash)/cy concrete)*0.15/ 2000 lb = 0.0473 lb/cy		0.0473		0.07874	1.42E-01	0.24	0.14	3.41	0.24	5.67	1.94E-02	8.51E-02	0.03	0.14	99.0%	Bag, enclosure, or equivalent or baghouse at truck exhaust ring
Central mix loading, Table 11.12-2, "0.156 lb/ton of cement/flyash" x ((491 lb cement + 73 lb flyash)/cy concrete)/ 2000 lb = 0.0440 lb/cy. PM2.5 was calculated as 15% of PM: "0.572 lb/ton of cement+flyash" x ((491 lb cement + 73 lb flyash)/cy concrete)*0.15/ 2000 lb = 0.0242 lb/cy		0.0000		0.0000	0.00E+00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00E+00	0.00	0.00	99.0%	Bag/sock control
Point Sources Total Emissions		**4.65E-02**		**8.30E-02**	**1.68E-01**	**3.27E-01**	**1.68E-01**	**4.03E+00**	**3.27E-01**	**7.84E+00**	**3.57E-03**	**1.56E-02**	**1.24E-02**	**5.43E-02**		
Process Fugitive Emissions		**0.003555**		**0.0114**	**0.27**	**0.86**	**0.27**	**6.40**	**0.86**	**20.54**	**0.04**	**0.16**	**0.12**	**0.51**		
Facility Wide Total: Point Sources + Process Fugitives (Except for Road Dust and Wind-blown Dust)				0.0944		1.19	0.43	10.43	1.19	28.38			0.13	0.57		

POINT SOURCE EMISSIONS for FACILITY CLASSIFICATION[6] Controlled EF at 2,628,000 cy/yr T/yr (controlled PTE @ 8,760)

Facility Classification Total PM		8.40E-03		1.10E+01
Facility Classification Total $PM10^{6,8}$		4.21E-03		5.54E+00

[1] The EFs were calculated using EFs in lb/ton of material handled from Table 11.12-5, and a percentage of PM that is considered to be PM_{10}. The percentage used to establish the EFs were based on AP-42, Appendix B, Table B-2-2, Category 3. It was established that the fraction that is PM_{10} is 15%. Note that the aggregate and sand handling are static EFs in this spreadsheet, but varies during modeling as the wind speed changes each hour.

[2] The EFs were calculated using EFs in lb/ton of material handled from Table 11.12-2, typical composition per cubic yard of concrete (1856 lb aggregate, 1426 lbs sand, 491 lbs cement, 73 lbs cement supplement, and 20 gallons of water = 4024 lb/cy), and closely match Table 11.12-5 values (version 0606) when rounded to the same number of figures. AP-42 lists the same EFs for uncontrolled and controlled emissions, so control estimates are based on the assumed control/cycle input on the right hand side of the table.

[3] Max. hourly only includes reductions associated with control assumptions

[4] Hourly emissions rate (24 hr average) = Max hourly emissions rate x (hrs per day) / 24
Daily emissions rate = max emissions rate (1-hr average) x proposed hrs/day

[5] Annual average hourly emissions rate = EF (lb/cy) x proposed annual production rate (cy/yr) / (8760 hr/yr)
Annual emissions rate = EF (lb/cy) x proposed annual production rate (cy/yr) /(2000 lb/T)

[6] Controlled EFs for PM = 0.0002 (cement silo) + 0.0003 (flyash silo) +0.0078(weigh batcher)
for PM10 = 0.0001 (cement silo) + 0.0002 (flyash silo) +0.0040 (weigh batcher)

[7] Emissions for Facility Classification are based on baghouse as process equipment, 24-hr day, 8760 hr/yr = 7,200 cy/day, and 2,628,000 cy/yr

[8] Emissions for Facility Classification do not include truck mix loading emissions; this is typically considered a fugitive emission source for concrete batch plants

Lead emissions

Emissions Point	Lead Emission Factor[1] (lb/ton of material loaded)		Increase in Emissions from this PTC: Emission Rate, Max	Emissions for Comparison with DEQ Modeling Threshold	Emission Rate, Quarterly	Emissions for Facility Classification	
	Controlled with fabric filter	Uncontrolled	lb/hr, 1-hr avg[2]	lb/month[3]	T/yr[4]	lb/hr, daily avg[5]		T/yr
Cement delivery to silo [7]	1.09E-08		8.03E-07	5.80E-04	8.03E-04	8.03E-07	Point Source	3.52E-06
Cement supplement delivery to Silo [7]	5.20E-07		5.09E-06	4.16E-03	6.83E-03	5.69E-06	Point Source	2.49E-05
Truck Loadout (with 99.9% control) [8]		3.62E-08	3.06E-06	2.24E-03	3.06E-03	3.06E-06	Fugitive	
Total			**9.56E-06**	**6.93E-03**	**0.011**		**Point Sources**	**2.85E-05**
DEQ Modeling Threshold				100	0.6			
Modeling Required?				No	No			

[1] The emissions factors are from AP-42, Table 11.12-8 (version 0606)
[2] Max. hourly rate = EF x pound of cement/yd³ of concrete x max. hourly concrete production rate/(2000 lb/T)
[3] lb/mo = EF x pound of material/yd³ of concrete x max. daily concrete production rate x [365/12]/(2000 lb/T)
[4] T/yr = EF x pound of material/yd³ of concrete x max. annual concrete production rate/(2000 lb/T)
[5] lb/hr, daily avg = lb/mo x 3 months per qtr / (670 hrs per qtr)

Toxic Air Pollutant (TAPs) EMISSIONS INVENTORY, Concrete Batch Plant

4/26/2019 11:47

Facility Information

Company: Knife River Corporation Mountain West - Boise
Facility ID: 777-00386
Permit No.: P-2009.0071

Source Type: Portable
Manufacturer: CON-E-CO/LO-PRO-12 or equivalent

Emissions estimates are based on EFs in AP-42, Table 11.12-8 (version 06/06) and the following composition of one yard of concrete:

Coarse aggregate		1865 pounds
Sand		1428 pounds
Cement		491 pounds
Cement supplement		73 pounds
Water		20 gallons
Concrete		**4024 pounds**

Truck Mix Loadout Factor: 1
Central Mix Batching Factor: 0

DEQ EI VERIFICATION WORKSHEET Version 032007
Tip: Blue text or numbers are meant to be changed.
Black text or numbers indicates it's hard-wired or calculated.
Review these before you change them.

Concrete Production

Maximum Hourly Production Rate:	300	cy/hr	
Proposed Daily Production Rate:	7,200	cy/day	
Proposed Maximum Annual Production Rate:	360,000	cy/year	

Uncontrolled (Unlimited Production Rate)

7,200 cy/day	24 hrs/day, 7 day/wk,
2,628,000 cy/year	52 wks/year

TAP Emission Factors from AP-42, Table 11.12-8 (Version 06/06)

Emissions Point	Arsenic EF (lb/ton of material loaded)		Beryllium EF (lb/ton of material loaded)		Cadmium EF (lb/ton of material loaded)		Chromium EF (lb/ton of material loaded)		Manganese EF (lb/ton of material loaded)		Nickel EF (lb/ton of material loaded)		Phosphorus EF (lb/ton of material loaded)		Selenium EF (lb/ton of material loaded)		Chromium VI
	Controlled with Fabric filter	Uncontrolled	Controlled with Fabric filter	Uncontrolled	Controlled with Fabric filter	Uncontrolled	Controlled with Fabric filter	Uncontrolled	Controlled with Fabric filter	Uncontrolled	Controlled with Fabric filter	Uncontrolled	Controlled with Fabric filter	Uncontrolled	Controlled with Fabric filter	Uncontrolled	Percent of total Cr that is Cr+6
Cement silo filling (with baghouse)	**4.24E-09**		**4.86E-10**				**2.90E-08**		**1.17E-07**		**4.18E-08**			**1.18E-05**			**20%**
Cement supplement silo filling (with baghouse)	**1.00E-06**		**9.04E-08**		**1.98E-10**		**1.22E-06**		**2.56E-07**		**2.28E-06**		**3.54E-06**		**7.24E-08**		**30%**
Truck loading (no boot or shroud)		**1.22E-05**		**2.44E-07**		**3.42E-08**		**1.14E-05**		**6.12E-05**		**1.19E-05**		**3.84E-05**		**2.62E-06**	**21.29%**
Central Mix Batching (NO boot or shroud)		**0.00E+00**				**0.00E+00**		**0.00E+00**		**0.00E+00**		**0.00E+00**		**0.00E+00**			**21.29%**

UNCONTROLLED TAP EMISSIONS **Note: Includes baghouses as process equipment.** **7,200 cy/day, and** **2,628,000 cy/yr**

Emissions Point	Arsenic		Beryllium		Cadmium		Chromium		Manganese		Nickel		Phosphorus		Selenium		Chromium VI		
	lb/hr annual avg.	T/yr[4]	lb/hr annual avg.	T/yr	lb/hr annual avg	T/yr	lb/hr 24-hr avg.	T/yr[5]	lb/hr 24-hr avg.	T/yr	lb/hr annual avg.	T/yr	lb/hr 24-hr avg.	T/yr	lb/hr 24-hr avg.	T/yr	lb/hr annual avg.		
Cement silo filling (with baghouse)	3.12E-07	1.37E-06	3.58E-08	1.57E-07	1.72E-05	7.55E-05	2.14E-06	8.13E-05	8.62E-06	3.77E-05	3.08E-06	1.35E-05	8.69E-04	3.81E-03	ND	ND	4.27E-07		
Cement supplement silo filling (with baghouse)	1.10E-05	4.80E-05	9.90E-07	4.34E-06	2.17E-09	9.50E-09	1.34E-05	5.85E-05	2.80E-06	1.23E-05	2.50E-05	1.09E-04	3.88E-05	1.70E-04	7.93E-07	3.47E-06	4.01E-06		
Truck loading (no boot or shroud)	1.03E-03	4.52E-03	2.06E-05	9.04E-05	2.89E-06	1.27E-05	9.64E-04	4.22E-03	5.16E-03	2.27E-02	1.01E-03	4.41E-03	3.25E-03	1.42E-02	2.22E-04	9.71E-04	2.05E-04		
Sources Total	**1.04E-03**	4.57E-03	**2.17E-05**	9.49E-05	**2.01E-05**	8.62E-05	**9.80E-04**	4.36E-03	**5.19E-03**	2.27E-02	**1.03E-03**	4.53E-03	**4.16E-03**	1.82E-02	**2.22E-04**	9.74E-04	**2.10E-04**	**5.56E-02**	**Tons per year**
IDAPA Screening EL (lb/hr)	1.50E-06		2.80E-05		3.70E-06		3.30E-02		3.33E-01		2.70E-05		7.00E-03		1.30E-02		5.60E-07		
EXCEEDS EL?	Yes		No		Yes		No		No		Yes		No		No		Yes		

CONTROLLED TAP EMISSIONS **Note: Includes baghouses as process equipment.** **7,200 cy/day, and** **360,000 cy/year**

Emissions Point	Arsenic		Beryllium		Cadmium		Chromium		Manganese		Nickel		Phosphorus		Selenium		Chromium VI		
	lb/hr annual avg.	T/yr[4]	lb/hr annual avg.	T/yr	lb/hr annual avg.	T/yr	lb/hr 24-hr avg.	T/yr[5]	lb/hr 24-hr avg.	T/yr	lb/hr annual avg.	T/yr	lb/hr 24-hr avg.	T/yr	lb/hr 24-hr avg.	T/yr	lb/hr annual avg.		
Cement silo filling (with baghouse)[3]	4.26E-08	1.87E-07	4.90E-09	2.15E-08	2.36E-06	1.03E-05	2.14E-06	1.28E-08	8.52E-06	5.17E-06	4.22E-07	1.85E-06	ND	ND	ND	ND	5.85E-08		
Cement supplement silo filling (with baghouse)[3]	1.50E-06	6.57E-06	1.36E-07	5.94E-07	2.97E-10	1.30E-09	8.99E-05	8.02E-05	1.59E-05	1.58E-06	3.42E-06	1.50E-05	2.61E-04	2.33E-06	7.93E-07	4.76E-07	5.49E-07		
Truck loading (with baghouse)	1.41E-06	6.19E-06	2.83E-08	1.24E-07	3.96E-09	1.74E-08	9.64E-06	5.79E-06	5.18E-05	3.11E-05	1.38E-06	6.04E-06	3.25E-05	1.95E-05	2.22E-06	1.33E-06	2.81E-07	**99.00%**	Boot, enclosure, or equivalent or baghouse or boot w/water ring
Sources Total	**2.96E-06**	1.30E-05	**1.69E-07**	7.39E-07	**2.37E-06**	1.04E-05	**1.02E-04**	1.51E-05	**7.92E-05**	3.79E-05	**5.22E-06**	2.29E-05	**2.93E-04**	4.27E-05	**3.01E-06**	1.81E-06	**8.89E-07**	**1.44E-04**	**Tons per year**
IDAPA Screening EL (lb/hr)	1.50E-06		2.80E-05		3.70E-06		3.30E-02		3.33E-01		2.70E-05		7.00E-03		1.30E-02		5.60E-07		
Percent of EL	197.11%		0.60%		63.92%		0.31%		0.0238%		19.34%		4.19%		0.0231%		158.72%		
EXCEEDS EL?	Yes		No		No		No		No		No		No		No		Yes		

[1] lb/hr, annual average = EF x pound of cement / Yd^3 of concrete x annual concrete production rate / 2000lb/Ton / 8760 hr/yr; lb/hr, 24-hr = EF x pound of cement / Yd3 of concrete x daily concrete production rate / 2000lb/Ton / 24 hr/day

[2] lb/hr, annual average = EF x pound of cement supplement / Yd^3 of concrete x annual concrete production rate / 2000lb/Ton / 8760 hr/yr; lb/hr, 24-hr average = EF x pound of cement supplement / Yd3 of concrete x daily concrete production rate / 2000lb/Ton

[3] lb/hr, annual average = EF x pound of (cement + cement supplement) / Yd^3 of concrete x annual concrete production rate / 2000lb/Ton / 8760 hr/yr; lb/hr, 24-hr average = EF x pound of (cement + cement supplement) / Yd3 of concrete x daily concrete production

[4] T/yr = lb/hr, annual avg x 8760 hr/yr x (1T/2000 lb)

[5] T/yr = EF x pound of cement, or cement supplement, or cement + cement supplement x annual concrete production rate /2000 lb/ton / 2000 lb/ton

NATURAL GAS COMBUSTION, AP-42 SECTION 1.4 (7/98)

2.8 MMBtu/hr / 1,020 MMBtu/MMscf = 2.75E-03 MMscf/hr **Fuel Use:**

Operating Assumptions: 24 hr/day 0.066 MMscf/day

8,760 hr/yr 24.047 MMscf/year

Criteria Air Pollutants	Emission Factor	Emissions		CBP + Boiler Emissions	Modeling Threshold		Modeling Required?	Modeling Threshold		Modeling Required?
	lb/MMscf	lb/hr	T/yr	T/yr	2002 Guidance			Case-by-Case		
NO2	100	2.75E-01	1.20E+00	1.20E+00	1	T/yr	YES	7	T/yr	No
CO	84	2.31E-01	1.01E+00	1.01E+00	14	lb/hr	No	70	lb/hr	No
PM10	7.6	2.09E-02	9.14E-02	1.46E-01	0.2	lb/hr	No	0.9	lb/hr	No
		2.09E-02	9.14E-02		1	T/yr	No	7	T/yr	No
PM2.5	7.6	2.09E-02	9.14E-02	1.07E-01						
		2.09E-02	9.14E-02							
SOx	0.6	1.65E-03	7.21E-03	7.21E-03	0.2	lb/hr	No	0.9	lb/hr	No
		1.65E-03	7.21E-03		1	T/yr	No	7	T/yr	No
VOC	5.5	1.51E-02	6.61E-02	6.61E-02	40	T/yr	No			
Lead	0.0005	1.37E-06	6.01E-06	1.15E-02	0.6	T/yr	No			
Lead, continued			5.37E-03	lb/quarter	10	lb/mo	No			
		TOTAL	2.38E+00	T/yr	Note: 100 lb/mo Pb in guidance reduced by factor of 10 based on latest Pb NAAQS (reduced in 2008 from 1.5 ug/m3 to 0.15 ug/m3)					

Hazardous Air Pollutants (HAPs) and Toxic Air Pollutants (TAPs)					Exceeds EL/ Modeling Required?
	lb/MMscf	lb/hr	T/yr	EL (lb/hr)	
PAH HAPs					
2-Methylnaphthalene	2.40E-05	**6.59E-08**	**6.59E-08**	9.10E-05	No
3-Methylchloranthrene	1.80E-06	**4.94E-09**	**4.94E-09**	2.50E-06	No
7,12-Dimethylbenz(a)anthrace	1.60E-05	**4.39E-08**	**1.97E-07**		
Acenaphthene	1.80E-06	**4.94E-09**	**4.94E-09**	9.10E-05	No
Acenaphthylene	1.80E-06	**4.94E-09**	**4.94E-09**	9.10E-05	No
Anthracene	2.40E-06	**6.59E-09**	**6.59E-09**	9.10E-05	No
Benzo(a)anthracene	1.80E-06	**4.94E-09**	**4.94E-09**	9.10E-05	See POM
Benzo(a)pyrene	1.20E-06	**3.29E-09**	**3.29E-09**	2.00E-06	See POM
Benzo(b)fluoranthene	1.80E-06	**4.94E-09**	**4.94E-09**		See POM
Benzo(g,h,i)perylene	1.20E-06	**3.29E-09**	**3.29E-09**	9.10E-05	No
Benzo(k)fluoranthene	1.80E-06	**4.94E-09**	**4.94E-09**		See POM
Chrysene	1.80E-06	**4.94E-09**	**4.94E-09**		See POM
Dibenzo(a,h)anthracene	1.20E-06	**3.29E-09**	**3.29E-09**		See POM
Dichlorobenzene	1.20E-03	**3.29E-06**	**3.29E-06**	9.10E-05	No
Fluoranthene	3.00E-06	**8.24E-09**	**8.24E-09**	9.10E-05	No
Fluorene	2.80E-06	**7.69E-09**	**7.69E-09**	9.10E-05	No
Indeno(1,2,3-cd)pyrene	1.80E-06	**4.94E-09**	**4.94E-09**		See POM
Naphthalene	6.10E-04	**6.11E-04**	2.68E-03	3.33	No
Naphthalene	6.10E-04	**1.67E-06**	**1.67E-06**	9.10E-05	No
Phenanethrene	1.70E-05	**4.67E-08**	**4.67E-08**	9.10E-05	No
Pyrene	5.00E-06	**1.37E-08**	**1.37E-08**	9.10E-05	No
Polycyclic Organic Matter (POM)	7-PAH Group	**3.13E-08**	**3.13E-08**	2.00E-06	No
Non-PAH HAPs					
Benzene	2.10E-03	**5.76E-06**	**5.76E-06**	8.00E-04	No
Formaldehyde	7.50E-02	**2.06E-04**	**2.06E-04**	5.10E-04	No
Hexane	1.80E+00	4.94E-03	2.16E-02	12	No
Toluene	3.40E-03	9.33E-06	4.09E-05	25	No
Non-HAP Organic Compounds					
Butane	2.10E+00	5.76E-03	2.52E-02		
Ethane	3.10E+00	8.51E-03	3.73E-02		
Pentane	2.60E+00	7.14E-03	3.13E-02	116	No
Propane	1.60E+00	4.39E-03	1.92E-02		
Metals (HAPs)					
Arsenic	2.00E-04	**5.49E-07**	**5.49E-07**	1.50E-06	No
Barium	4.40E-03	1.21E-05	5.29E-05	0.033	No
Beryllium	1.20E-05	**3.29E-08**	**3.29E-08**	2.80E-05	No
Cadmium	1.10E-03	**3.02E-06**	**3.02E-06**	3.70E-06	No
Chromium	1.40E-03	3.84E-06	1.68E-05	0.033	No
Cobalt	8.40E-05	2.31E-07	1.01E-06	0.0033	No
Copper	8.50E-04	2.33E-06	1.02E-05	0.013	No
Manganese	3.80E-04	1.04E-06	4.57E-06	0.067	No
Mercury	2.60E-04	7.14E-07	3.13E-06	0.003	No
Molybdenum	1.10E-03	3.02E-06	1.32E-05	0.333	No
Nickel	2.10E-03	**5.76E-06**	**5.76E-06**	2.70E-05	No
Selenium	2.40E-05	**6.59E-08**	**2.89E-07**	0.013	No
Vanadium	2.30E-03	6.31E-06	2.77E-05	0.003	No
Zinc	2.90E-02	7.96E-05	3.49E-04	0.667	No

NOTE: TAPs lb/hr emissions are 24-hour averages unless shown in bold. Bold emissions are annual averages for carcinogens.

Case-by-Case Modeling Thresholds may be used ONLY with DEQ Approval

TOTAL CBP + WATER HEATER EMISSIONS (POINT SOURCES, T/YR)	2.55

Pre Poject Data Input

1. Facility Information

Facility Name:	Knife River Corporation Mountain West - Boise
Facility ID:	777-00386
Permit and Project No.:	P-2009.0071
Source Type:	Portable
Manufacturer/Model:	CON-E-CO/LO-PRO-12 or equivalent

2. Concrete Production Rates

Maximum Hourly Concrete Production Rate:	300		
Proposed Daily Concrete Production Rate:	7,200	cy/day	24.00
Proposed Maximum Annual Concrete Production Rate:	2,628,000	cy/year	hr/day

3. Daily Operating Hours

Maximum daily hours of operation for facility?	24

4. Concrete Batch Plant Specifications

Is the facility type a truck mix (T) or central mix (C)?	T
What level of PM control is used for loadout, either Truck or Central?	99%
What level of PM control is used for fugitive emissions?	75%

5. Water Heater Usage

Does this facility use a water heater?	Yes		
How many units?	1	Heat Input Rating	
What type of fuel, Diesel, Natural Gas or Propane for unit 1?	Natural Gas	2.8	MMBtu/hr
If multiple units, what type of fuel, Diesel, Natural Gas or Propane for unit 2?	N/A	0	MMBtu/hr
Are you assuming continual operations throughout the year?	No		
Maximum annual hours of water heater operation? (If assuming continual operation, enter 8,760)	8,760		

6. Internal Combustion Engine(s)

Are internal combustion engines used to provide electrical power at the facility?	No	Please enter 0 for all units.
How many small engines (less than or equal to 600 bhp) are being used at the facility?	0	
Horsepower rating of small engine #1 (<=600 bhp)? (If non-road or no engine enter 0)	0	
Horsepower rating of small engine #2 (<=600 bhp)? (If non-road or no engine enter 0)	0	
Horsepower rating of large engine (greater than 600 bhp)? (If non-road or no engine enter 0)	0	

Note: If there is no small or large engine enter -1 for the certification	Small IC Engine #1	Small IC Engine #2	Large IC Engine
Select the EPA Certification:	-1	-1	-1
Not an EPA-certified IC engine: Enter "0" (zero)			
Certified Tier I, Tier 2, Tier 3, or Tier 4 IC engine: Enter 1, 2, 3, or 4			
Certified "BLUE SKY" IC engine: Enter 5			

Enter the annual operating hours for the small IC engine(s)	0
Enter the annual operating hours for the large IC engine	0

7. Transfer Points

Enter the total number of transfer points in the facility? (2 is the default)	2

CRITERIA POLLUTANT EMISSION INVENTORY for Portable Concrete Batch Plant

Facility Information 4/26/19 13:11

Company:	Knife River Corporation Mountain West - Boise
Facility ID:	777-00386
Permit and Project No.:	P-2009.0071
Source Type:	Portable
Manufacturer/Model:	CON-E-COLO PRO-12 or equivalent

Assumptions Implied or Stated in Application:

Ave control assumptions

Truck Mix (T) or Central Mix (C): T

Production Rates[1]

Maximum Hourly Production Rate	200	cy/hr		Per manufacturer
Proposed Daily Production Rate	7,200	cy/day	24.00	Hours of operation per day at max capacity
Proposed Maximum Annual Production Rate	2,628,000	cy/year		
Cement Storage Silo Capacity	4x40	ft³ of stacked cement		
Cement Storage Silo Large Compartment Capacity for cement only	65%	of the silo capacity		
Cement Storage Silo small Compartment Capacity for cement or ash	35%	of the silo capacity		

PM_{10} Emissions due to this PTC

Emissions Point	PM_{10} Emission Factor[1] (lb/cy)		PM_{10} Emission Factor[2] (lb/cy)		Controlled Emission Rate PM_{10}, Max	Controlled Emission Rate PM_{10}, Max	Controlled Emissions Rate PM_{10}, 24-hour average		Controlled Emission Rate PM_{10}, 24-hour average		Controlled Emission Rate PM_{10}, annual average		Controlled Emission Rate PM_{10}, annual average		
	Controlled	Uncontrolled	Controlled	Uncontrolled	lb/hr[3]	lb/hr[3]	lb/hr[4]	lb/day[4]	lb/hr[4]	lb/day[4]	tpy[5]	T/yr[5]	lb/hr[5]	T/yr[5]	Control Assumptions:
Aggregate delivery to ground storage		0.00096		0.0031	0.07	0.23	0.07	1.73	0.233	5.58	7.20E-02	3.15E-01	0.233	1.018	75% Water Sprays at Operator's Discretion
Sand delivery to ground storage		0.000225		0.0007	0.02	0.05	1.69E-02	0.41	0.053	1.27	1.69E-02	7.39E-02	0.053	0.231	75% Water Sprays at Operator's Discretion
Aggregate transfer to conveyor		0.00096		0.0031	0.07	0.23	0.07	1.73	0.233	5.58	7.20E-02	3.15E-01	0.233	1.018	75% Water Sprays at Operator's Discretion
Sand transfer to conveyor		0.000225		0.0007	0.02	0.05	1.69E-02	0.41	0.053	1.27	1.69E-02	7.39E-02	0.053	0.231	75% Water Sprays at Operator's Discretion
Aggregate transfer to elevated storage		0.00096		0.0031	0.07	0.23	0.07	1.73	0.233	5.58	7.20E-02	3.15E-01	0.233	1.018	75% Water Sprays at Operator's Discretion
Sand transfer to elevated storage		0.000225		0.0007	0.02	0.05	1.69E-02	0.41	0.053	1.27	1.69E-02	7.39E-02	0.053	0.231	75% Water Sprays at Operator's Discretion
Cement delivery to Silo (controlled EF)	0.00003		0.0001		0.00E-03	2.50E-02	9.00E-03	2.16E-01	2.50E-02	6.01E-01	9.00E-03	3.94E-02	2.50E-02	1.10E-01	0.00% Baghouse in process equipment, use controlled EF
Cement supplement delivery to Silo (controlled EF)	0.000045		0.0002		1.35E-02	5.30E-02	1.35E-02	3.24E-01	5.35E-02	1.29E+00	1.35E-02	5.91E-02	5.30E-02	2.35E-01	0.00% Baghouse in process equipment, use controlled EF
Weigh hopper loading (sand & aggregate batcher loading)		0.001186		0.00395	3.56E-02	1.19E-02	3.56E-02	8.55E-02	1.19E-02	2.85E-01	3.56E-03	1.56E-02	1.19E-02	5.19E-02	99.0% Sealed boot (vents back to silo or baghouse
Truck mix loading, Table 11.12-2, "0.156 lb/ton of cement+flyash" x ((491 lb cement + 73 lb flyash)/cy concrete)/ 2000 lb = 0.0474 lb/cy. PM2.5 was calculated as 15% of PM "0.118 lb/ton of cement+flyash" x ((491 lb cement + 73 lb flyash)/cy concrete)*0.15/2000 lb = 0.0473 lb/cy		0.0473		0.07874	1.42E-01	0.24	0.14	3.41	0.24	5.87	1.42E-01	6.22E-01	0.24	1.03	99.0% Boot, enclosure, or back to silo or baghouse or boot vented to the
Central mix loading, Table 11.12-2, "0.156 lb/ton of cement+flyash" x ((491 lb cement + 73 lb flyash)/cy concrete)/ 2000 lb = 0.0440 lb/cy. PM2.5 was calculated as 15% of PM "0.572 lb/ton of cement+flyash" x ((491 lb cement + 73 lb flyash)/cy concrete)*0.15/2000 lb = 0.0242 lb/cy		0.0000		0.0000	0.00E+00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00E+00	0.00	0.00	99.0% Baghouse control
Point Sources Total Emissions		**4.86E-02**		**8.30E-02**	**1.66E-01**	**3.27E-01**	**1.66E-01**	**4.03E+00**	**3.27E-01**	**7.84E+00**	**2.61E-02**	**1.14E-01**	**0.05E-02**	**3.67E-01**	
Process Fugitive Emissions		**0.000555**		**0.0114**	**0.27**	**0.80**	**0.27**	**6.40**	**0.80**	**20.54**	**0.27**	**1.17**	**0.80**	**3.75**	
Facility Wide Total: Point Sources + Process Fugitives (Except for Road Dust and Windblown Dust)				0.0944		1.18	0.43	10.43	1.18	28.38			0.85	4.15	

POINT SOURCE EMISSIONS for FACILITY CLASSIFICATION[6]	Controlled EF	at	2,628,000 cy/yr	T/yr	(controlled PTE @ 8,760)
Facility Classification Total PM[6]	8.40E-03			1.10E+01	
Facility Classification Total PM10[6,8]	4.21E-03			5.54E+00	

[1] The EFs were calculated using EFs in lb/ton of material handled from Table 11.12-5, and a percentage of PM that is considered to be PM_{10}. The percentage used to establish the EFs were based on AP-42, Appendix B, Table B-2.2, Category 3. It was established that the fraction that is $PM_{2.5}$ is 15%. Note that the aggregate and sand handling are static EFs in the spreadsheet, but varies during modeling as the wind speed changes each hour.

[2] The EFs were calculated using EFs in lb/ton of material handled from Table 11.12-2, typical composition per cubic yard of concrete (1865 lb aggregate, 1428 lbs sand, 491 lbs cement, 73 lbs cement supplement, and 20 gallons of water = 4324 lb/cy), and closely match Table 11.12-5 values (version 6/06) when rounded to the same number of figures. AP-42 calls the same EFs for uncontrolled and controlled emissions, so control estimates are based on the assumed control levels input on the right hand side of the table.

[3] Max. hourly rate includes reductions associated with control assumptions

[4] Hourly emissions rate (24-hr average) = Max hourly emissions rate x (hrs per day) / 24
Daily emissions rate = max emissions rate (1-hr average) x proposed hrs/day

[5] Annual average hourly emissions rate = EF (lb/cy) x proposed annual production rate (cy/yr) / (8760 hr/yr)
Annual emissions rate = EF (lb/cy) x proposed annual production rate (cy/yr) /(2000 lb/T)

[6] Controlled EFs for PM = 0.0002 (cement silo) + 0.0003 (flyash silo) +0.0079(weigh batcher)
for PM10 = 0.0001 (cement silo) + 0.0002 (flyash silo) +0.0040 (weigh batcher)

[7] Emissions for Facility Classification are based on baghouses as process equipment, 24-hr day, 8760 hr/yr = 7,200 cy/day, and 2,628,000 cy/yr

[8] Emissions for Facility Classification do not include truck mix loading emissions; this is typically considered a fugitive emission source for concrete batch plants.

Lead emissions

Emissions Point	Lead Emission Factor[1] (lb/ton of material loaded)		Increase in Emissions from this PTC: Emission Rate, Max	Emissions for Comparison with DEQ Modeling Threshold		Emission Rate, Quarterly	Emissions for Facility Classification	
	Controlled with fabric	Uncontrolled	lb/hr, 1-hr avg[2]	lb/month[3]	T/yr[4]	lb/hr, qtrly avg[5]		T/yr
Cement delivery to silo [7]	1.00E-08	[illegible]	9.03E-07	5.86E-04	7.03E-03	8.03E-07	Point Source	3.52E-06
Cement supplement delivery to Silo [7]	5.20E-07	[illegible]	5.69E-05	4.16E-03	4.99E-02	5.80E-06	Point Source	2.49E-05
Truck Loadout (with 99.0% control) [7]		3.82E-06	3.06E-06	2.24E-03	2.68E-02	3.00E-06	Fugitive	
Total			**0.55E-06**	**0.98E-03**	**0.084**		**Point Sources**	**2.85E-05**
DEQ Modeling Threshold				100	0.6			
Modeling Required?				No	No			

[1] The emissions factors are from AP-42, Table 11.12-5 (version 06/06)
[2] Max. hourly rate = EF x pound of cement/yd³ of concrete x max. hourly concrete production rate/2000 lb/T)
[3] lb/mo = EF x pound of material/yd³ of concrete x max. daily concrete production rate x (365/12)/(2000 lb/T)
[4] T/yr = EF x pound of material/yd³ of concrete x max. annual concrete production rate/2000 lb/T)
[5] lb/hr, qtrly avg = lb/mo x 3 months per qtr / (8760/4)hrs per qtr

Toxic Air Pollutant (TAPs) EMISSIONS INVENTORY, Concrete Batch Plant

4/26/2019 13:11

Facility Information

Company: Knife River Corporation Mountain West - Boise
Facility ID: 777-00386
Permit No.: P-2009.0071
Source Type: Portable
Manufacturer: CON-E-CO/LO-PRO-12 or equivalent

Emissions estimates are based on EFs in AP-42, Table 11.12-8 (version 06/06) and the following composition of one yard of concrete:

Coarse aggregate		1865 pounds
Sand		1428 pounds
Cement		491 pounds
Cement supplement		73 pounds
Water		20 gallons
Concrete		**4024 pounds**

Truck Mix Loadout Factor: 1
Central Mix Batching Factor: 0

DEQ EI VERIFICATION WORKSHEET Version 032007
Tip: Blue text or numbers are meant to be changed.
Black text or numbers indicates it's hard-wired or calculated.
Review these before you change them.

Concrete Production

Maximum Hourly Production Rate:	300	cy/hr	
Proposed Daily Production Rate:	7,200	cy/day	
Proposed Maximum Annual Production Rate:	2,628,000	cy/year	

Uncontrolled (Unlimited Production Rate)

7,200 cy/day	24 hrs/day, 7 day/wk,
2,628,000 cy/year	52 wks/year

TAP Emission Factors from AP-42, Table 11.12-8 (Version 06/06)

Emissions Point	Arsenic EF (lb/ton of material loaded)		Beryllium EF (lb/ton of material loaded)		Cadmium EF (lb/ton of material loaded)		Chromium EF (lb/ton of material loaded)		Manganese EF (lb/ton of material loaded)		Nickel EF (lb/ton of material loaded)		Phosphorus EF (lb/ton of material loaded)		Selenium EF (lb/ton of material loaded)		Chromium VI
	Controlled with Fabric filter	Uncontrolled	Controlled with Fabric filter	Uncontrolled	Controlled with Fabric filter	Uncontrolled	Controlled with Fabric filter	Uncontrolled	Controlled with Fabric filter	Uncontrolled	Controlled with Fabric filter	Uncontrolled	Controlled with Fabric filter	Uncontrolled	Controlled with Fabric filter	Uncontrolled	Percent of total Cr that is Cr+6
Cement silo filling (with baghouse)	4.24E-09	[illegible]	4.86E-10	[illegible]	[illegible]	[illegible]	2.90E-08	[illegible]	1.17E-07	[illegible]	4.18E-08	[illegible]	[illegible]	1.18E-05	[illegible]	[illegible]	20%
Cement supplement silo filling (with baghouse)	1.00E-06	[illegible]	9.04E-08	[illegible]	1.98E-10	[illegible]	1.22E-06	[illegible]	2.56E-07	[illegible]	2.26E-06	[illegible]	3.54E-06	[illegible]	7.24E-08	[illegible]	30%
Truck loading (no tool or shroud)	[illegible]	1.22E-05	[illegible]	2.44E-07	[illegible]	3.42E-08	[illegible]	1.14E-05	[illegible]	6.12E-05	[illegible]	1.19E-05	[illegible]	3.84E-05	[illegible]	2.62E-06	21.29%
Central Mix Batching (NO dust or shroud)	[illegible]	0.00E+00	[illegible]	[illegible]	[illegible]	0.00E+00	[illegible]	0.00E+00	[illegible]	0.00E+00	[illegible]	0.00E+00	[illegible]	0.00E+00	[illegible]	[illegible]	21.29%

UNCONTROLLED TAP EMISSIONS Note: Includes baghouses as process equipment. 7,200 cy/day, and 2,628,000 cy/yr

Emissions Point	Arsenic		Beryllium		Cadmium		Chromium		Manganese		Nickel		Phosphorus		Selenium		Chromium VI		
	lb/hr annual avg.	T/yr[4]	lb/hr annual avg.	T/yr	lb/hr annual avg.	T/yr	lb/hr 24-hr avg.	T/yr[5]	lb/hr 24-hr avg.	T/yr	lb/hr annual avg.	T/yr	lb/hr 24-hr avg.	T/yr	lb/hr 24-hr avg.	T/yr	lb/hr annual avg.		
Cement silo filling (with baghouse)	3.12E-07	1.37E-06	3.58E-08	1.57E-07	1.72E-05	7.55E-05	2.14E-06	8.13E-05	8.62E-06	3.77E-05	3.08E-06	1.35E-05	8.69E-04	3.81E-03	ND	ND	4.27E-07		
Cement supplement silo filling (with baghouse)	1.10E-05	4.80E-05	9.90E-07	4.34E-06	2.17E-09	9.50E-09	1.34E-05	5.85E-05	2.80E-06	1.23E-05	2.50E-05	1.09E-04	3.86E-05	1.70E-04	7.93E-07	3.47E-06	4.01E-06		
Truck loading (no tool or shroud)	1.03E-03	4.52E-03	2.06E-05	9.04E-05	2.89E-06	1.27E-05	9.64E-04	4.22E-03	5.18E-03	2.27E-02	1.01E-03	4.41E-03	3.25E-03	1.42E-02	2.22E-04	9.71E-04	2.05E-04		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
Sources Total	**1.04E-03**	4.57E-03	**2.17E-05**	9.49E-05	**2.01E-05**	8.82E-05	**9.80E-04**	4.36E-03	**5.19E-03**	2.27E-02	**1.03E-03**	4.53E-03	**4.16E-03**	1.82E-02	**2.22E-04**	9.74E-04	**2.10E-04**	**5.56E-02**	Tons per year
IDAPA Screening EL (lb/hr)	1.50E-06		2.80E-05		3.70E-06		3.30E-02		3.33E-01		2.70E-05		7.00E-03		1.30E-02		5.60E-07		
EXCEEDS EL?	Yes		No		Yes		No		No		Yes		No		No		Yes		

CONTROLLED TAP EMISSIONS Note: Includes baghouses as process equipment. 7,200 cy/day, and 2,628,000 cy/year

Emissions Point	Arsenic		Beryllium		Cadmium		Chromium		Manganese		Nickel		Phosphorus		Selenium		Chromium VI		
	lb/hr annual avg.	T/yr[4]	lb/hr annual avg.	T/yr	lb/hr annual avg.	T/yr	lb/hr 24-hr avg.	T/yr[5]	lb/hr 24-hr avg.	T/yr	lb/hr annual avg.	T/yr	lb/hr 24-hr avg.	T/yr	lb/hr 24-hr avg.	T/yr	lb/hr annual avg.		
Cement silo filling (with baghouse)[1]	3.12E-07	1.37E-06	3.58E-08	1.57E-07	1.72E-05	7.55E-05	2.14E-06	9.36E-06	8.62E-06	3.77E-05	3.08E-06	1.35E-05	ND	ND	ND	ND	4.27E-07		
Cement supplement silo filling (with baghouse)[2]	1.10E-05	4.80E-05	9.90E-07	4.34E-06	2.17E-09	9.50E-09	8.99E-05	5.85E-05	1.89E-05	1.23E-05	2.50E-05	1.09E-04	2.61E-04	1.70E-04	7.93E-07	3.47E-06	4.01E-06		
Truck loading (with baghouse)	1.03E-05	4.52E-05	2.06E-07	9.04E-07	2.89E-08	1.27E-07	9.64E-06	4.22E-05	5.18E-05	2.27E-04	1.01E-05	4.41E-05	3.25E-05	1.42E-04	2.22E-06	9.71E-06	2.05E-06	**99.00%**	Boot, enclosure, or equivalent or baghouse or boot w/water ring
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Sources Total	**2.16E-05**	9.45E-05	**1.23E-06**	5.40E-06	**1.73E-05**	7.56E-05	**1.02E-04**	1.10E-04	**7.92E-05**	2.77E-04	**3.81E-05**	1.67E-04	**2.93E-04**	3.12E-04	**3.01E-06**	1.32E-05	**6.49E-06**	**1.05E-03**	Tons per year
IDAPA Screening EL (lb/hr)	1.50E-06		2.80E-05		3.70E-06		3.30E-02		3.33E-01		2.70E-05		7.00E-03		1.30E-02		5.60E-07		
Percent of EL	1438.90%		4.40%		466.63%		0.31%		0.0238%		141.16%		4.19%		0.0231%		1158.68%		
EXCEEDS EL?	Yes		No		Yes		No		No		Yes		No		No		Yes		

[1] lb/hr, annual average = EF x pound of cement / Yd^3 of concrete x annual concrete production rate / 2000lb/Ton / 8760 hr/yr; lb/hr, 24-hr = EF x pound of cement / Yd3 of concrete x daily concrete production rate / 2000lb/Ton / 24 hr/day
[2] lb/hr, annual average = EF x pound of cement supplement / Yd^3 of concrete x annual concrete production rate / 2000lb/Ton / 8760 hr/yr; lb/hr, 24-hr average = EF x pound of cement supplement / Yd3 of concrete x daily concrete production rate / 2000lb/Ton
[3] lb/hr, annual average = EF x pound of (cement + cement supplement) / Yd^3 of concrete x annual concrete production rate / 2000lb/Ton / 8760 hr/yr; lb/hr, 24-hr average = EF x pound of (cement + cement supplement) / Yd3 of concrete x daily concrete production
[4] T/yr = lb/hr, annual avg x 8760 hr/yr x (1T/2000 lb)
[5] T/yr = EF x pound of cement, or cement supplement, or cement + cement supplement x annual concrete production rate /2000 lb/ton / 2000 lb/ton

NATURAL GAS COMBUSTION, AP-42 SECTION 1.4 (7/98)

Operating Assumptions: 2.8 MMBtu/hr / 1,020 MMBtu/MMscf = 2.75E-03 MMscf/hr
24 hr/day
8,760 hr/yr

Fuel Use:
0.066 MMscf/day
24.047 MMscf/year

Criteria Air Pollutants	Emission Factor	Emissions		CBP + Boiler Emissions	Modeling Threshold		Modeling Required?	Modeling Threshold		Modeling Required?
	lb/MMscf	lb/hr	T/yr	T/yr	2002 Guidance			Case-by-Case		
NO2	100	2.75E-01	1.20E+00	1.20E+00	1	T/yr	YES	7	T/yr	No
CO	84	2.31E-01	1.01E+00	1.01E+00	14	lb/hr	No	70	lb/hr	No
PM10	7.6	2.09E-02	9.14E-02	4.68E-01	0.2	lb/hr	No	0.9	lb/hr	No
		2.09E-02	9.14E-02		1	T/yr	No	7	T/yr	No
PM2.5	7.6	2.09E-02	9.14E-02	2.05E-01						
		2.09E-02	9.14E-02							
SOx	0.6	1.65E-03	7.21E-03	7.21E-03	0.2	lb/hr	No	0.9	lb/hr	No
		1.65E-03	7.21E-03		1	T/yr	No	7	T/yr	No
VOC	5.5	1.51E-02	6.61E-02	6.61E-02	40	T/yr	No			
Lead	0.0005	1.37E-06	6.01E-06	8.37E-02	0.6	T/yr	No			
Lead, continued			5.37E-03	lb/quarter	10	lb/mo	No			
		TOTAL	2.38E+00	T/yr	Note: 100 lb/mo Pb in guidence reduced by factor of 10 based on latest Pb NAAQS (reduced in 2008 from 1.5 ug/m3 to 0.15 ug/m3)					

Hazardous Air Pollutants (HAPs) and Toxic Air Pollutants (TAPs)					Exceeds EL/ Modeling Required?
	lb/MMscf	lb/hr	T/yr	EL (lb/hr)	
PAH HAPs					
2-Methylnaphthalene	2.40E-05	6.59E-08	6.59E-08	9.10E-05	No
3-Methylchloranthrene	1.80E-06	4.94E-09	4.94E-09	2.50E-06	No
7,12-Dimethylbenz(a)anthracene	1.60E-05	4.39E-08	1.92E-07		
Acenaphthene	1.80E-06	4.94E-09	4.94E-09	9.10E-05	No
Acenaphthylene	1.80E-06	4.94E-09	4.94E-09	9.10E-05	No
Anthracene	2.40E-06	6.59E-09	6.59E-09	9.10E-05	No
Benzo(a)anthracene	1.80E-06	4.94E-09	4.94E-09	9.10E-05	See POM
Benzo(a)pyrene	1.20E-06	3.29E-09	3.29E-09	2.00E-06	See POM
Benzo(b)fluoranthene	1.80E-06	4.94E-09	4.94E-09		See POM
Benzo(g,h,i)perylene	1.20E-06	3.29E-09	3.29E-09	9.10E-05	No
Benzo(k)fluoranthene	1.80E-06	4.94E-09	4.94E-09		See POM
Chrysene	1.80E-06	4.94E-09	4.94E-09		See POM
Dibenzo(a,h)anthracene	1.20E-06	3.29E-09	3.29E-09		See POM
Dichlorobenzene	1.20E-03	3.29E-06	3.29E-06	9.10E-05	No
Fluoranthene	3.00E-06	8.24E-09	8.24E-09	9.10E-05	No
Fluorene	2.80E-06	7.69E-09	7.69E-09	9.10E-05	No
Indeno(1,2,3-cd)pyrene	1.80E-06	4.94E-09	4.94E-09		See POM
Naphthalene	6.10E-04	6.11E-04	2.68E-03	3.33	No
Naphthalene	6.10E-04	1.67E-06	1.67E-06	9.10E-05	No
Phenanthrene	1.70E-05	4.67E-08	4.67E-08	9.10E-05	No
Pyrene	5.00E-06	1.37E-08	1.37E-08	9.10E-05	No
Polycyclic Organic Matter (POM) 7-PAH Group		3.13E-08	3.13E-08	2.00E-06	No
Non-PAH HAPs					
Benzene	2.10E-03	5.76E-06	5.76E-06	8.00E-04	No
Formaldehyde	7.50E-02	2.06E-04	2.06E-04	5.10E-04	No
Hexane	1.80E+00	4.94E-03	2.16E-02	12	No
Toluene	3.40E-03	9.33E-06	4.09E-05	25	No
Non-HAP Organic Compounds					
Butane	2.10E+00	5.76E-03	2.52E-02		
Ethane	3.10E+00	8.51E-03	3.73E-02		
Pentane	2.60E+00	7.14E-03	3.13E-02	116	No
Propane	1.60E+00	4.39E-03	1.92E-02		
Metals (HAPs)					
Arsenic	2.00E-04	5.49E-07	5.49E-07	1.50E-06	No
Barium	4.40E-03	1.21E-05	5.29E-05	0.033	No
Beryllium	1.20E-05	3.29E-08	3.29E-08	2.80E-05	No
Cadmium	1.10E-03	3.02E-06	3.02E-06	3.70E-06	No
Chromium	1.40E-03	3.84E-06	1.68E-05	0.033	No
Cobalt	8.40E-05	2.31E-07	1.01E-06	0.0033	No
Copper	8.50E-04	2.33E-06	1.02E-05	0.013	No
Manganese	3.80E-04	1.04E-06	4.57E-06	0.667	No
Mercury	2.60E-04	7.14E-07	3.13E-06	0.003	No
Molybdenum	1.10E-03	3.02E-06	1.32E-05	0.333	No
Nickel	2.10E-03	5.76E-06	5.76E-06	2.70E-05	No
Selenium	2.40E-05	6.59E-08	2.89E-07	0.013	No
Vanadium	2.30E-03	6.31E-06	2.77E-05	0.003	No
Zinc	2.90E-02	7.96E-05	3.49E-04	0.667	No

NOTE: TAPs lb/hr emissions are 24-hour averages unless shown in bold. Bold emissions are annual averages for carcinogens.

Case-by-Case Modeling Thresholds may be used ONLY with DEQ Approval

TOTAL CBP + WATER HEATER EMISSIONS (POINT SOURCES, T/YR)	3.06

APPENDIX B – AMBIENT AIR QUALITY IMPACT ANALYSES

MEMORANDUM

DATE: May 20, 2019

TO: Dan Pitman, Permit Writer, Air Program

FROM: Kevin Schilling, Air Quality Dispersion Modeling Supervisor, Air Program

PROJECT: P-2009.0071 Project 62220 – Knife River Corporation – Mountain West Portable Concrete Batch Plant

SUBJECT: Demonstration of Compliance with IDAPA 58.01.01.203.02 (NAAQS) and 203.03 (TAPs) as it relates to air quality impact analyses – Criteria Pollutant Modeling Exemption and TAPs Modeling Exemption

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Contents

Acronyms, Units, and Chemical Nomenclature

AAC	Acceptable Ambient Concentration of a non-carcinogenic TAP
AACC	Acceptable Ambient Concentration of a Carcinogenic TAP
Appendix W	40 CFR 51, Appendix W – Guideline on Air Quality Models
BPIP	Building Profile Input Program
BRC	Below Regulatory Concern
CBP	Concrete Batch Plant
CFR	Code of Federal Regulations
CMAQ	Community Multi-Scale Air Quality modeling system
CO	Carbon Monoxide
DEQ	Idaho Department of Environmental Quality
EL	Emissions Screening Level of a TAP
EPA	United States Environmental Protection Agency
Idaho Air Rules	Rules for the Control of Air Pollution in Idaho, located in the Idaho Administrative Procedures Act 58.01.01
Knife River	Knife River Corporation
lb/hr	Pounds per hour
lb/yr	Pounds per year
NAAQS	National Ambient Air Quality Standards
NO_2	Nitrogen Dioxide
NOx	Oxides of Nitrogen
O_3	Ozone
Pb	Lead
PM_{10}	Particulate matter with an aerodynamic particle diameter less than or equal to a nominal 10 micrometers
$PM_{2.5}$	Particulate matter with an aerodynamic particle diameter less than or equal to a nominal 2.5 micrometers
ppb	parts per billion
PTC	Permit to Construct
PTE	Potential to Emit
SIL	Significant Impact Level
SO_2	Sulfur Dioxide
TAP	Toxic Air Pollutant
VOCs	Volatile Organic Compounds
$\mu g/m^3$	Micrograms per cubic meter of air

1.0 Summary

Knife River Corporation (Knife River) submitted a Permit to Construct (PTC) application for modifications to their portable concrete batch plant (CBP), currently located in Boise, Idaho. Idaho Administrative Procedures Act 58.01.01.203.02 and 203.03 (Idaho Air Rules Section 203.02 and 203.03) requires that no permit be issued unless it is demonstrated that applicable emissions do not result in violation of a National Ambient Air Quality Standard (NAAQS) or Toxic Air Pollutant (TAP) increment. Criteria pollutant emission increases resulting from operation of the proposed project are below DEQ air impact modeling thresholds and project-specific modeling analyses were not required for permit issuance. TAP impact analyses were not required for permit issuance because emission increases were below applicable TAP screening emissions levels (ELs). This memorandum provides a summary of the applicability assessment for analyses used to demonstrate compliance with applicable NAAQS and TAP increments, as required by Idaho Air Rules Section 203.02 and 203.03.

Knife River prepared the PTC application and DEQ performed the project emission inventory and modeling applicability evaluation for analyses required to demonstrate compliance with applicable National Ambient Air Quality Standards (NAAQS) and Toxic Air Pollutant (TAP) increments. DEQ review of submitted data and DEQ analyses summarized by this memorandum addressed only the rules, policies, methods, and data pertaining to the air impact analyses used to demonstrate that estimated emissions associated with operation of the facility will not cause or significantly contribute to a violation of any applicable air quality standard. This review did not address/evaluate compliance with other rules or analyses not pertaining to the air impact analyses. Evaluation of emission estimates was the responsibility of the DEQ permit writer and is addressed in the main body of the DEQ Statement of Basis, and emission calculation methods were not evaluated in this modeling review memorandum.

The submitted information and analyses: 1) showed either a) that estimated potential/allowable emissions are at a level defined as below regulatory concern (BRC) and do not require a NAAQS compliance demonstration, or b) that criteria pollutant emissions increases resulting from the proposed project are below site-specific modeling applicability thresholds, developed to assure that emissions below such levels will not result in ambient air impacts exceeding Significant Impact Levels (SILs); 2) showed that TAP emissions increases associated with the project are either below applicable emission screening levels (ELs) or are exempt from the requirement to assess impacts.

Table 1 presents key assumptions that should be considered in the permit writer's evaluation of the proposed project.

The submitted information and DEQ analyses demonstrated to the satisfaction of the Department that operation of the proposed project will not cause or significantly contribute to a violation of any ambient air quality standard, provided the key conditions in Table 1 are representative of facility design capacity or operations as limited by a federally enforceable permit condition. The DEQ permit writer should use Table 1 and other information presented in this memorandum to generate appropriate permit provisions/restrictions to assure emissions do not exceed applicable regulatory thresholds requiring further analyses.

Table 1. KEY ASSUMPTIONS USED IN MODELING ANALYSES	
Criteria/Assumption/Result	**Explanation/Consideration**
General Criteria Pollutant Emissions Rates Criteria air pollutant emissions rates used in the air permitting analyses, as listed in the permit application, must represent maximum potential emissions as given by design capacity, inherently limited by the nature of the process or configuration of the facility, or as limited by the issued permit for the specific pollutant and averaging period.	Air impact modeling analyses may be required for emissions rates greater than those listed in this memorandum.
TAP Emissions Sources TAP emissions must be accurately represented by the analyses, with the project's emission increases remaining below non-carcinogenic and carcinogenic screening rate emission limits.	TAPs emission increases that exceed ELs are subject to a compliance demonstration based on modeling. Modeling of TAPs was not required, provided controlled emissions for the project are below Section 585 and 586 screening emission levels (ELs).

Summary of Submittals and Actions

April 17, 2019	Application received by DEQ.
April 26, 2019	Application determined complete by DEQ.

2.0 Background Information

This section provides background information on the project and required air impact analyses.

2.1 Project Description

The proposed project involves modification of an existing permitted portable CBP. Knife River proposes to add a fly ash silo and reduce annual production from 2,638,000 cubic yards/year (cy/year) to 360,000 cy/year. Addition of the silo will not affect daily production of concrete.

2.2 Air Impact Analyses Required for All Permits to Construct

Idaho Air Rules Sections 203.02 and 203.03:

> *No permit to construct shall be granted for a new or modified stationary source unless the applicant shows to the satisfaction of the Department all of the following:*
>
> ***02. NAAQS.*** *The stationary source or modification would not cause or significantly contribute to a violation of any ambient air quality standard.*
>
> ***03. Toxic Air Pollutants.*** *Using the methods provided in Section 210, the emissions of toxic air pollutants from the stationary source or modification would not injure or unreasonably affect human or animal life or vegetation as required by Section 161. Compliance with all applicable toxic air pollutant carcinogenic increments and toxic air pollutant non-carcinogenic increments will also demonstrate preconstruction compliance with Section 161 with regards to the pollutants listed in Sections 585 and 586.*

Atmospheric dispersion modeling, using computerized simulations, is used to demonstrate compliance with both NAAQS and TAPs. Idaho Air Rules Section 202.02 states:

> ***02. Estimates of Ambient Concentrations.*** *All estimates of ambient concentrations shall be based on the applicable air quality models, data bases, and other requirements specified in 40 CFR 51 Appendix W (Guideline on Air Quality Models).*

2.3 Significant Impact Level and Cumulative NAAQS Impact Analyses

If specific criteria pollutant emission increases associated with the proposed permitting project cannot qualify for a BRC exemption as per Idaho Air Rules Section 221, then the permit cannot be issued unless the application demonstrates that applicable emission increases will not cause or significantly contribute to a violation of NAAQS, as required by Idaho Air Rules Section 203.02.

The first phase of a NAAQS compliance demonstration is to evaluate whether the proposed facility/project could have a significant impact to ambient air. Section 3.1.1 of this memorandum describes the applicability evaluation of Idaho Air Rules Section 203.02. The Significant Impact Level (SIL) analysis for a new facility or proposed modification to a facility involves modeling estimated criteria air pollutant emissions from the facility or modification to determine the potential impacts to ambient air. Air impact analyses are required by Idaho Air Rules to be conducted in accordance with methods outlined in Appendix W. Appendix W requires that facilities be modeled using emissions and operations representative of design capacity or as limited by a federally enforceable permit condition.

A facility or modification is considered to have a significant impact on air quality if maximum modeled impacts to ambient air exceed the established SIL listed in Idaho Air Rules Section 006 (referred to as a "significant contribution" in Idaho Air Rules) or as incorporated by reference as per Idaho Air Rules Section 107.03.b. Table 2 lists the applicable SILs.

If modeled maximum pollutant impacts to ambient air from the emission sources associated with a new facility or modification exceed the SILs, then a cumulative NAAQS impact analysis is necessary to demonstrate compliance with NAAQS and Idaho Air Rules Section 203.02.

A cumulative NAAQS impact analysis for attainment area pollutants involves assessing ambient impacts (typically the design values consistent with the form of the standard) from potential/allowable emissions resulting from the project and emissions from any nearby co-contributing sources (including existing emissions from the facility that are unrelated to the project), and then adding a DEQ-approved background concentration value to the modeled result that is appropriate for the criteria pollutant/averaging-period at the facility location and the area of significant impact. The resulting pollutant concentrations in ambient air are then compared to the NAAQS listed in Table 2. Table 2 also lists SILs and specifies the modeled design value that must be used for comparison to the NAAQS. NAAQS compliance is evaluated on a receptor-by-receptor basis for the modeling domain.

Table 2. APPLICABLE REGULATORY LIMITS

Pollutant	Averaging Period	Significant Impact Levels[a] ($\mu g/m^3$)[b]	Regulatory Limit[c] ($\mu g/m^3$)	Modeled Design Value Used[d]
PM_{10}[e]	24-hour	5.0	150[f]	Maximum 6th highest[g]

$PM_{2.5}$[h]	24-hour	1.2	35[i]	Mean of maximum 8th highest[j]
	Annual	0.2	12[k]	Mean of maximum 1st highest[l]
Carbon monoxide (CO)	1-hour	2,000	40,000[m]	Maximum 2nd highest[n]
	8-hour	500	10,000[m]	Maximum 2nd highest[n]
Sulfur Dioxide (SO_2)	1-hour	3 ppb[o] (7.8 µg/m^3)	75 ppb[p] (196 µg/m^3)	Mean of maximum 4th highest[q]
	3-hour	25	1,300[m]	Maximum 2nd highest[n]
	24-hour	5	365[m]	Maximum 2nd highest[n]
	Annual	1.0	80[r]	Maximum 1st highest[n]
Nitrogen Dioxide (NO_2)	1-hour	4 ppb (7.5 µg/m^3)	100 ppb[s] (188 µg/m^3)	Mean of maximum 8th highest[t]
	Annual	1.0	100[r]	Maximum 1st highest[n]
Lead (Pb)	3-month[u]	NA	0.15[r]	Maximum 1st highest[n]
	Quarterly	NA	1.5[r]	Maximum 1st highest[n]
Ozone (O_3)	8-hour	40 TPY VOC[v]	70 ppb[w]	Not typically modeled

a. Idaho Air Rules Section 006 (definition for significant contribution) or as incorporated by reference as per Idaho Air Rules Section 107.03.b.
b. Micrograms per cubic meter.
c. Incorporated into Idaho Air Rules by reference, as per Idaho Air Rules Section 107.
d. The maximum 1st highest modeled value is always used for the significant impact analysis unless indicated otherwise. Modeled design values are calculated for each ambient air receptor.
e. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.
f. Not to be exceeded more than once per year on average over 3 years.
g. Concentration at any modeled receptor when using five years of meteorological data.
h. Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.
i. 3-year mean of the upper 98th percentile of the annual distribution of 24-hour concentrations.
j. 5-year mean of the 8th highest modeled 24-hour concentrations at the modeled receptor for each year of meteorological data modeled. For the SIL analysis, the 5-year mean of the 1st highest modeled 24-hour impacts at the modeled receptor for each year.
k. 3-year mean of annual concentration.
l. 5-year mean of annual averages at the modeled receptor.
m. Not to be exceeded more than once per year.
n. Concentration at any modeled receptor.
o. Interim SIL established by EPA policy memorandum.
p. 3-year mean of the upper 99th percentile of the annual distribution of maximum daily 1-hour concentrations.
q. 5-year mean of the 4th highest daily 1-hour maximum modeled concentrations for each year of meteorological data modeled. For the significant impact analysis, the 5-year mean of 1st highest modeled 1-hour impacts for each year is used.
r. Not to be exceeded in any calendar year.
s. 3-year mean of the upper 98th percentile of the annual distribution of maximum daily 1-hour concentrations.
t. 5-year mean of the 8th highest daily 1-hour maximum modeled concentrations for each year of meteorological data modeled. For the significant impact analysis, the 5-year mean of maximum modeled 1-hour impacts for each year is used.
u. 3-month rolling average.
v. An annual emissions rate of 40 ton/year of VOCs is considered significant for O_3.
w. Annual 4th highest daily maximum 8-hour concentration averaged over three years.

If the cumulative NAAQS impact analysis indicates a violation of the standard, the permit may not be issued if the proposed project has a significant contribution (exceeding the SIL) to the modeled violation. If project-specific impacts are below the SIL, then the project does not have a significant contribution to the specific violations.

Compliance with Idaho Air Rules Section 203.02 is generally demonstrated if: a) applicable specific criteria pollutant emission increases are at a level defined as BRC, using the criteria established by DEQ regulatory interpretation[1]; or b) all modeled impacts of the SIL analysis are below the applicable SIL or other level determined to be inconsequential to NAAQS compliance; or c) modeled design values of the cumulative NAAQS impact analysis (modeling all emissions from the facility and co-contributing sources, and adding a background concentration) are less than applicable NAAQS at receptors where impacts from the proposed facility/modification exceeded the SIL or other identified level of

consequence; or d) if the cumulative NAAQS analysis showed NAAQS violations, the impact of proposed facility/modification to any modeled violation was inconsequential (typically assumed to be less than the established SIL) for that specific receptor and for the specific modeled time when the violation occurred.

2.4 Toxic Air Pollutant Analyses

Emissions of toxic substances are generally addressed by Idaho Air Rules Section 161:

> *Any contaminant which is by its nature toxic to human or animal life or vegetation shall not be emitted in such quantities or concentrations as to alone, or in combination with other contaminants, injure or unreasonably affect human or animal life or vegetation.*

Permitting requirements for toxic air pollutants (TAPs) from new or modified sources are specifically addressed by Idaho Air Rules Section 203.03 and require the applicant to demonstrate to the satisfaction of DEQ the following:

> *Using the methods provided in Section 210, the emissions of toxic air pollutants from the stationary source or modification would not injure or unreasonably affect human or animal life or vegetation as required by Section 161. Compliance with all applicable toxic air pollutant carcinogenic increments and toxic air pollutant non-carcinogenic increments will also demonstrate preconstruction compliance with Section 161 with regards to the pollutants listed in Sections 585 and 586.*

Per Section 210, if the total project-wide emission increase of any TAP associated with a new source or modification exceeds screening emission levels (ELs) of Idaho Air Rules Section 585 or 586, then the ambient impact of the emission increase must be estimated. If ambient impacts are less than applicable Acceptable Ambient Concentrations (AACs) for non-carcinogens of Idaho Air Rules Section 585 and Acceptable Ambient Concentrations for Carcinogens (AACCs) of Idaho Air Rules Section 586, then compliance with TAP requirements has been demonstrated.

Idaho Air Rules Section 210.20 states that if TAP emissions from a specific source are regulated by the Department or EPA under 40 CFR 60, 61, or 63, then a TAP impact analysis under Section 210 is not required for that TAP. The DEQ permit writer evaluates the applicability of specific TAPs to the Section 210.20 exclusion.

3.0 Analytical Methods and Data

This section describes the methods and data used in analyses to demonstrate compliance with applicable air quality impact requirements. The DEQ Statement of Basis provides a discussion of the methods and data used to estimate criteria and TAP emission rates.

3.1 Emission Source Data

Emissions increases of criteria pollutants and TAPs resulting from the proposed project were estimated by DEQ for the applicable averaging periods. The calculation of potential emissions is the responsibility of

the DEQ permit writer, and the representativeness and accuracy of emission estimates is not addressed in this modeling memorandum. Emissions associated with this project were estimated using a DEQ-generated spreadsheet. DEQ air impact analysts are responsible for assuring that potential emission rates provided in the emission inventory are properly used in the modeling applicability assessment. The rates listed must represent the maximum allowable rate as averaged over the specified period.

Emission rates used in the impact modeling applicability analyses, as listed in this memorandum, should be reviewed by the DEQ permit writer and compared with those in the final emission inventory. All criteria air pollutant and TAP emission rates must be equal to or greater than the facility's potential emissions calculated in the PTC emission inventory or proposed permit allowable emission rates.

3.1.1 Modeling Applicability and Modeled Criteria Pollutant Emissions Rates

If project-specific emission increases for criteria pollutants would qualify for a BRC permit exemption as per Idaho Air Rules Section 221 if it were not for potential emissions of one or more pollutants exceeding the BRC threshold of 10 percent of emissions defined by Idaho Air Rules as significant, then a NAAQS compliance demonstration may not be required for those pollutants with emissions below BRC levels. DEQ's regulatory interpretation policy of exemption provisions of Idaho Air Rules is that: "A DEQ NAAQS compliance assertion will not be made by the DEQ modeling group for specific criteria pollutants having a project emissions increase below BRC levels, provided the proposed project would have qualified for a Category I Exemption for BRC emissions quantities except for the emissions of another criteria pollutant.[1]" The interpretation policy also states that the exemption criteria of uncontrolled potential to emit (PTE) not to exceed 100 ton/year (Idaho Air Rules Section 220.01.a.i) is not applicable when evaluating whether a NAAQS impact analyses is required. A permit will be issued limiting PTE below 100 ton/year, thereby negating the need to maintain calculated uncontrolled PTE under 100 ton/year. The BRC exemption cannot be used to exempt a project from a pollutant-specific NAAQS compliance demonstration in cases where a PTC is required for the action regardless of emissions quantities, such as the modification of an existing emissions or throughput limit.

A NAAQS compliance demonstration is generally required to be performed for pollutant increases that would not qualify for the BRC exemption from the requirement to demonstrate compliance with NAAQS. Site-specific air impact modeling analyses may not be necessary for some pollutants, even where such emissions do not qualify for the BRC exemption. DEQ has developed modeling applicability thresholds, below which a site-specific modeling analysis is not required. DEQ generic air impact modeling analyses that were used to develop the modeling thresholds provide a conservative SIL analysis for projects with emissions below identified threshold levels. Project-specific modeling applicability thresholds are provided in the *Idaho Air Modeling Guideline*[2]. These thresholds were based on assuring an ambient impact of less than the established SIL for specific pollutants and averaging periods.

Because the proposed project requires modification of the existing permit, it cannot qualify for a BRC exemption or pollutant-specific exclusion from NAAQS compliance demonstration requirements.

Site-specific air impact modeling analyses may not be necessary for some pollutants, even where such emissions do not qualify for the BRC exemption. DEQ has developed modeling applicability thresholds, below which a site-specific modeling analysis is not required. DEQ generic air impact modeling analyses that were used to develop the modeling thresholds provide a conservative SIL analysis for projects with emissions below identified threshold levels. Project-specific modeling applicability thresholds are provided in the *Idaho Air Modeling Guideline*[2]. These thresholds were based on assuring an ambient impact of less than the established SIL for specific pollutants and averaging periods.

Projects may be exempted from site-specific modeling requirements for criteria air pollutants based on Level I and Level II modeling thresholds contained in DEQ's *Modeling Guideline*[2]. If project-specific total emissions rate increases of a pollutant are below Level I Modeling Applicability Thresholds, then project-specific air impact analyses are not necessary for permitting. The Level I modeling thresholds are generally viewed as de minimis values and are applied for most projects. Use of Level II Modeling Applicability Thresholds are less conservative and their use is conditional, requiring DEQ approval. DEQ approval of the Level II modeling thresholds is based on dispersion-affecting characteristics of the emissions sources such as stack height, stack gas exit velocity, stack gas temperature, distance from sources to ambient air, presence of elevated terrain, and potential exposure to sensitive public receptors. Level I and Level II modeling thresholds for each criteria pollutant may have both short-term and annual average thresholds, based on the averaging periods of the SILs and NAAQS. For example, the current PM_{10} NAAQS is limited to a 24-hour averaging period, so only a short-term threshold based on a pound per hour value is relevant. The current NO_2 NAAQS are based on a 1-hour averaging period and an annual averaging period, so Level I and II modeling thresholds have been established for short-term and annual averaging periods, and applicability is evaluated independently for annual and short-term thresholds.

Table 3 provides the results of site-specific modeling applicability for the proposed project. Operation of proposed silo only affects particulate emissions; therefore, other pollutants were not included in the table. The new silo does not affect the daily operations of the CBP, and because allowable annual throughput will be decreased, the annual change in emissions is a net reduction. However, modeling applicability only considers emission increases, so project netting cannot be used at this step. Emissions in Table 3 represent emissions from filling the new fly ash silo at the specified allowable 360,000 cy/year production of concrete.

Table 3. Site-Specific Modeling Applicability

Pollutant/Averaging Period		Project-Wide Change in Emissions (pounds/hour)	Level I Modeling Applicability Threshold	Modeling Required?
$PM_{2.5}$[a]	24-hour	0.002	0.054 pound/hour	No
	Annual	0.008	0.35 ton/year	No
PM_{10}[b]	24-hour	0.007	0.22 pound/hour	No

a. Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.
b. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.

Ozone (O_3) differs from other criteria pollutants in that it is not typically emitted directly into the atmosphere. O_3 is formed in the atmosphere through reactions of VOCs, NOx, and sunlight. Atmospheric dispersion models used in stationary source air permitting analyses cannot be used to estimate O_3 impacts resulting from VOC and NOx emissions from an industrial facility. O_3 concentrations resulting from area-wide emissions are predicted by using more complex airshed models such as the Community Multi-Scale Air Quality (CMAQ) modeling system. Use of the CMAQ model is very resource intensive and DEQ asserts that performing a CMAQ analysis for a particular permit application is not typically a reasonable or necessary requirement for air quality permitting. Addressing secondary formation of O_3 within the context of permitting a new stationary source has been somewhat addressed in EPA regulation and policy. As stated in a letter from Gina McCarthy of EPA to Robert Ukeiley, acting on behalf of the Sierra Club (letter from Gina McCarthy, Assistant Administrator, United States Environmental Protection Agency, to Robert Ukeiley, January 4, 2012):

. . . footnote 1 to sections 51.166(I)(5)(I) of the EPA's regulations says the following: "No de minimis air quality level is provided for ozone. However, any net emission increase of 100 tons per year or more of volatile organic compounds or nitrogen oxides subject to PSD would be required to perform an ambient impact analysis, including the gathering of air quality data."

The EPA believes it unlikely a source emitting below these levels would contribute to such a violation of the 8-hour ozone NAAQS, but consultation with an EPA Regional Office should still be conducted in accordance with section 5.2.1.c. of Appendix W when reviewing an application for sources with emissions of these ozone precursors below 100 TPY."

DEQ determined it was not appropriate or necessary to require a quantitative source specific O_3 impact analysis because allowable emissions estimates of VOCs and NOx are below the 100 tons/year threshold.

Secondary Particulate Formation

The impact from secondary particulate formation resulting from emissions of NOx, SO_2, and/or VOCs was assumed by DEQ to be negligible based on the magnitude of emissions and the short distance from emissions sources to locations where maximum PM_{10} and $PM_{2.5}$ impacts are anticipated.

3.1.2 Toxic Air Pollutant Emissions Rates

TAP emission regulations under Idaho Air Rules Section 210 are only applicable to new or modified sources constructed after July 1, 1995. TAP emissions may be exempted from modeling requirements by either of two methods: 1) the project's 24-hour period emissions for non-carcinogenic TAPs and annual emissions averaged over 8,760-hours for carcinogenic TAPs are below ELs listed in Idaho Air Rules Sections 585 and 586; and, 2) certain TAPs are addressed by a federal New Source Performance Standard per 40 CFR 60 or a National Emission Standard for Hazardous Air Pollutants per 40 CFR 63 are excluded from TAP analyses by Idaho Air Rules Section 210.20.

Table 4 provides a summary of TAP emissions increases for the project. No federal emission standards apply to operations of the cement supplement silo, so no emissions of TAPs are excluded from consideration.

3.1.3 DEQ Review

DEQ determined from review of the permit application, review of the DEQ emissions inventory, and consultation with the DEQ permit writer assigned to the project, that an ambient air impact analysis was not required to demonstrate compliance with any TAPs increments specified in Sections 585 and 586 of the Idaho Air Rules. DEQ also determined that site-specific air impact analyses were not required to demonstrate compliance with any NAAQS.

Table 4. TAPs Exempted from Modeling Per Idaho Air Rules Section 210.20			
Toxic Air Pollutant	**Project Emissions (lb/hr)[a, b]**	**Screening Emissions Level[c] (lb/hr)**	**Modeling Required**
Arsenic[d]	1.50E-06	1.50E-06	No
Beryllium[d]	1.36E-07	2.80E-05	No
Cadmium[d]	2.97E-10	3.70E-06	No
Chromium[e]	8.99E-05	3.30E-02	No
Manganese[e]	1.89E-05	3.33E-01	No
Nickel[d]	3.42E-06	2.70E-05	No
Phosphorus[e]	2.61E-04	7.00E-03	No
Selenium[e]	7.93E-07	1.30E-02	No
Chromium VI[d]	5.49E-07	5.60E-07	No

a. Pounds per hour.
b. For a noncarcinogenic TAP, the emission rate listed is the maximum 24-hour, or daily, emission rate averaged over 24 hours/ day. For a carcinogenic TAP, the emission rate listed is the maximum annual emission rate averaged over 8,760 hours/year.
c. ELs are maximum emissions expressed as pounds/hour for the applicable averaging period (annual for carcinogens and 24-hour for noncarcinogens).
d. Carcinogen.
e. Noncarcinogen.

4.0 Conclusions

The information submitted with the PTC application demonstrated to DEQ's satisfaction that applicable emissions resulting from the facility will not cause or significantly contribute to a violation of any ambient air quality standard or TAP increment.

References

1. Memorandum titled "Policy on NAAQS compliance demonstration requirements", Tiffany Floyd, Administrator, July 11, 2014.

2. *State of Idaho Guideline for Performing Air Quality Impact Analyses.* Idaho Department of Environmental Quality. September 2013. State of Idaho DEQ Air Doc. ID AQ-011. Available at http://www.deq.idaho.gov/media/1029/modeling-guideline.pdf.\

APPENDIX C – FACILITY DRAFT COMMENTS

The following comments were received from the facility on June 11, 2019:

Facility Comment:

The facility proposed the following changes to the permit.

Table 1.1 Regulated Sources

Permit Section		Source	Control Equipment
	2	Concrete batch plant Manufacturer: CON-E-CO, or equivalent Model: LO-PRO-12, or equivalent Maximum production rate: 300 cubic yards of concrete per hour The plant has the following major components: • Cement I storage ~~bin~~ Silo with total storage of 860 cubic feet and PJC-300S silo dust control system • Cement II mobile storage silo with total storage of 1,900 cubic feet and PJC-300S silo dust control system • Fly ash storage silo with less than or equal to 110 cubic yard capacity and rated flow less than or equal to 1,600 acfm • 12-cubic yard cement batcher with BV-14 batcher dust control system • Four-compartment aggregate bin • 12-cubic yard aggregate batcher • (PIG) Cement horizontal silo and PJC-300S silo dust control system Manufacturer: Troxell Company Inc. Capacity: 180 tons SN No.: 1T95556187R719464	Cement I mobile storage ~~bin~~ Silo dust control system/baghouse Manufacturer: CON-E-CO, or equivalent Model: PJC-300S silo dust control system/baghouse, or equivalent Max. exit flow rate: 1,500 cfm for cement, or 1,000 cfm for fly ash Control efficiency: 99.9% for PM_{10} ~~The PM and PM_{10} emissions from the PIG are controlled by the silo dust control system baghouse.~~ Cement II mobile storage silo dust control system/baghouse Manufacturer: CON-E-CO, or equivalent Model: PJC-300S silo dust control system/baghouse, or equivalent Max. exit flow rate: 1,500 cfm for cement, or 1,000 cfm for fly ash Control efficiency: 99.9% for PM_{10} (PIG) Cement Horizontal Silo dust control system/baghouse Manufacturer: CON-E-CO, or equivalent Model: PJC-300S silo dust control system/baghouse, or equivalent Max. exit flow rate: 1,500 cfm for cement, or 1,000 cfm for fly ash Control efficiency: 99.9% for PM_{10}

2 Concrete Batch Plant

2.1 Process Description

The portable concrete batch plant is comprised of one portable PIG horizontal cement silo, ~~one~~ two cement storage silos, used as an additional storage, ~~one portable PIG horizontal cement silo used as an additional storage~~, one fly ash storage silo, one 12-cubic yard cement batcher, a four-compartment overhead aggregate bin, one 12-cubic yard aggregate batcher, conveyors, and 2.8 MMBtu/hr natural gas hot water heater. The plant combines sand, gravel, cement, fly ash, and water to produce concrete. Electricity of the plant is supplied by the local electric utility.

[11/21/2018]

2.2 Control Device Descriptions

PM_{10} emissions from the cement silo, the fly ash silo, the cement weigh batcher, and from truck mix loading are each controlled by a baghouse. The emissions point for each baghouse is listed in Table 2.1.

Table 2.1 Concrete Batch Plant Description

Emissions Units / Processes	Control Devices	Emission Points
(PIG) Horizontal cement silo	**PJC-300S silo dust control system/baghouse**	**Baghouse exhaust**
Cement I storage ~~bin~~Silo (PIG) Horizontal cement silo	PJC-300S silo dust control system/baghouse	Baghouse exhaust
Cement II Mobile storage silo	PJC-300S silo dust control system/baghouse	Baghouse exhaust
Fly Ash storage silo	Belle 330 Pulse Jet Baghouse	Baghouse Exhaust

DEQ Response: DEQ updated the permit as requested to more accurately describe the equipment that is permitted.

APPENDIX D – PROCESSING FEE

PTC Processing Fee Calculation Worksheet

Instructions:
Fill in the following information and answer the following questions with a Y or N. Enter the emissions increases and decreases for each pollutant in the table.

Company: Knife River Corporation - Mountain
Address: 5450 W. Gowen Road
City: Boise
State: Idaho
Zip Code: 83709
Facility Contact: Joseph Smith
Title: Regional Environmental Manager
AIRS No.: 777-00386

y Does this facility qualify for a general permit (i.e. concrete batch plant, hot-mix asphalt plant)? Y/N

Y Did this permit require engineering analysis? Y/N

N Is this a PSD permit Y/N (IDAPA 58.01.01.205.04)

Emissions Inventory			
Pollutant	Annual Emissions Increase (T/yr)	Annual Emissions Reduction (T/yr)	Annual Emissions Change (T/yr)
NO_X	0.0	0	0.0
SO_2	0.0	0	0.0
CO	0.0	0	0.0
PM10	0.0	1.23	-1.2
VOC	0.0	0	0.0
Total:	0.0	1.23	**-1.2**
Fee Due	$ 500.00		

Comments: